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The Thrifty Food Plan

Betty Peterkin, *Consumer and Food Economics Institute*

The Consumer and Food Economics Institute of the Agricultural Research Service of the Department of Agriculture prepares guidance materials to help people select diets that are good to eat, that are nutritious, and that families can afford. The Department's first guide to good eating was published in 1894 (2).¹ The bulletin "Foods: Nutritive Value and Cost" by W. O. Atwater presents nutritive values of foods in terms of protein, carbohydrate, fat, and "mineral matters." Dr. Atwater charted the relative economy of foods as sources of nutrients and suggested combinations of foods to meet food energy and protein needs for an average American male.

Since 1894, USDA has continued to provide dietary guidance materials and to conduct research needed for their development. USDA publications, such as Agriculture Handbook No. 8 "Composition of Foods—raw, processed, prepared" (10), summarize information on the nutrient content of foods. Results of USDA research on nutritional needs are used by the Food and Nutrition Board of the National Research Council along with other research results in establishing recommended amounts of nutrients for people in the United States. Research on food consumption in U.S. households provides information about what foods people eat and how much they pay for them.

Households vary widely in the kinds and amounts of food they use and the amount of money they spend for food. Such variation may occur because of differences in household income and the part of the income allocated for the purchase of food; the number of people, and the sex,

age, size, activity, and physical condition of people in the household. The food manager's interest, knowledge, and skill in buying and preparing food and the foods available to the household because of location or the home production of food also affect the foods eaten and the grocery bill. Other factors are activities of household members, which require eating away from home, and—perhaps of most importance—food preferences of household members. The USDA uses data from surveys of household food consumption to develop family food plans that allow for many of these variables.

THE USDA FAMILY FOOD PLANS

The USDA food plans are at four levels of cost—thrifty, low, moderate, and liberal. Most families will find the cost for one of these plans similar to the amount they spend for food. The plans allow for the number of persons and the sex and age of persons in the family. To do this, each plan specifies amounts of foods of different types (food groups) that together will provide nutritious diets for men, women, and children of different ages and for pregnant and nursing women. These amounts of food groups can be totaled for persons of the sex and age of family members to determine the plan for any family.

Families following the plans may choose from the food groups those foods that they can afford, that they can store properly, that they know how to prepare, and that they enjoy eating. Foods within a food group are generally similar to each other in nutritive value. In some groups—meat, poultry, and fish, for example—one food in the group

¹ Figures in parentheses refer to References on p. 8.

may be used to replace another in a meal. Each group is of special importance for one or more nutrients or as a source of food energy. While several groups may provide appreciable amounts of the same nutrient, the cost of providing the nutrient may differ considerably among groups. For example, foods in both the meat and bread groups provide iron; but a milligram of iron from the meat group costs much more than a milligram of iron from the bread group.

The USDA food plans at four cost levels developed in 1964 (5) were revised in 1974-75 (6, 7) to take into account new information about nutritional needs, nutritive values of foods, food prices, and food consumption of families.

The Recommended Dietary Allowances revised by the Food and Nutrition Board in 1974 were used as a basis for the nutritional goals for the new plans (4). Allowances established in 1974 for protein and ascorbic acid for all sex-age categories are substantially lower than the 1964 allowances used in developing the earlier plans. Also, the 1974 allowances for calcium, vitamin A value, riboflavin, and niacin for certain sex-age categories are lower than those set in 1964. On the other hand, thiamin allowances for all sex-age categories and iron allowances for some categories in 1974 are higher than those in 1964.

Three nutrients (vitamin B₆, vitamin B₁₂, and magnesium) for which allowances were not established in 1964 were considered in development of the new plans.

The nutritive values of some major types of foods have changed since 1964. For example, many ready-to-eat cereals are fortified with one-fourth or more of the recommended allowance for many nutrients; enriched bread and flour have more thiamin, riboflavin, and niacin added than in 1964. New information on the content of vitamin B₆ and vitamin B₁₂ for a limited number of foods has become available and was used to estimate amounts of these nutrients in the plans.

Shifts occurred in food prices between 1964 and 1974. Prices for most foods increased, but some increased more sharply than others. To account for shifts in the relative economy of foods, prices paid by survey families in 1965-66 (9) were updated to 1974 levels for use in revising the plans.

USDA's 1965-66 survey of household food consumption provided information for the first time on the food intake of individuals in the household (8). It also provided detailed information on the quantities and money value of food used (purchased, home-produced, or received as a gift or pay) by the total household (9). Data from this study were used to estimate the amounts of groups of foods used to prepare meals and snacks for men, women, and children of different ages in households using food at four levels of cost. These amounts of food groups made up the food consumption patterns used in developing the four new food plans.

Food consumption of households that used food valued at or slightly above the desired cost of the plan was adopted as the basis for the food consumption patterns for the plan. Such food patterns are believed to represent a way of eating that would be palatable to households that might use the plan.

Computerized techniques were designed for developing the new food plans. A quadratic programming model was used to find the combination of food groups (food plan) that represents as little change from the food consumption pattern as required to meet the nutritional goals at a given cost. In this model conformity to existing food consumption patterns is assumed as one measure of palatability of a diet.

THE THRIFTY FOOD PLAN

The thrifty food plan presented in tables 1 and 2 may be useful to the many nutritionists and workers in allied professions who counsel families who receive food stamps and other families with little money for food. The thrifty plan replaces the economy plan developed in 1964 as the least costly of USDA's four food plans and as the basis for the coupon allotment for the Food Stamp Program (1). The quantities of certain types of foods (such as milk; meat, poultry, and fish; or vegetables and fruit) in the thrifty plan for a family are guides to amounts of these foods the family might buy, or obtain in other ways, to provide well-balanced meals and snacks for family members for a week.

Comparing the kinds and amounts of foods the family customarily uses with those suggested in the plan is one way to learn if there are shortcomings in the family's diets. Big differences between amounts of food used and amounts in the plan may indicate shortcomings in the diet with respect to its nutritive value, to excessive food wasted, and to excessive cost.

Food Consumption Patterns and the Recommended Dietary Allowances

The food consumption patterns based on survey data for persons in households with relatively low food costs were adopted as the basis for the thrifty plan. Foods in these patterns provided the allowance plus 5 percent for some nutrients, but not for others. The allowances were increased by 5 percent to allow for nutrient loss associated with the discard of a small amount of edible food as plate waste or because of spoilage and the like. The discard of inedible parts of food, such as peelings, bone, and excessive fat, and the loss of vitamins in cooking are allowed for in the nutritive values used in estimating the nutrient content of foods consumed.

Patterns for all sex-age categories provided the allowance plus 5 percent for protein, vitamin A, thiamin, riboflavin,

Table 1.—*Thrifty Food Plan: Amounts of food for a week*¹

Family member	Milk group	Meat and alternates group			Vegetable and fruit group					Bread and cereal group ²				Other foods groups	
	Milk, cheese, ice cream ³	Meat, poultry, fish ⁴	Eggs	Dry beans and peas, nuts ⁵	Dark-green, deep-yellow vegetables	Citrus fruit, tomatoes	Pota- toes	Other vegetables, fruit	Cereal	Flour	Bread	Other bakery products	Fats, oils	Sugar, sweets	
	<i>Qt</i>	<i>Lb</i>	<i>No</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	<i>Lb</i>	
Child:															
7 months to 1 year . . .	5.0	0.39	1.2	0.15	0.41	0.55	0.09	2.49	⁶ 1.02	0.02	0.08	0.04	0.04	0.19	
1-2 years	3.3	.83	3.3	.17	.22	.89	.65	2.26	⁶ 1.02	.31	.78	.24	.11	.30	
3-5 years	3.5	.95	2.5	.28	.20	.92	.88	2.28	1.03	.37	.94	.53	.38	.74	
6-8 years	4.2	1.27	2.4	.49	.22	1.10	1.23	2.50	1.12	.62	1.42	.79	.51	.94	
9-11 years	4.9	1.61	3.4	.53	.28	1.52	1.48	3.38	1.34	.81	1.82	1.10	.60	1.20	
Male:															
12-14 years	5.2	1.79	3.6	.67	.33	1.45	1.59	3.30	1.22	.81	2.07	1.13	.77	1.21	
15-19 years	5.1	2.35	4.0	.43	.32	1.70	2.10	3.43	.98	.99	2.36	1.46	1.00	1.05	
20-54 years	2.6	3.03	4.0	.44	.39	1.80	2.02	3.69	.89	.92	2.29	1.33	.95	.86	
55 years and over . . .	2.4	2.45	4.0	.25	.51	1.85	1.75	3.77	1.09	.80	1.90	1.12	.79	.94	
Female:															
12-19 years	5.4	1.80	3.8	.28	.42	1.74	1.22	3.61	.72	.76	1.49	.84	.51	.74	
20-54 years	2.8	2.41	4.0	.27	.52	1.86	1.51	3.39	.90	.67	1.41	.67	.57	.57	
55 years and over . . .	2.8	1.84	4.0	.19	.60	2.02	1.26	3.73	1.12	.68	1.30	.58	.37	.45	
Pregnant	⁷ 5.2	2.69	4.0	.42	.56	2.17	1.89	4.03	1.13	.58	1.41	.66	.59	.58	
Nursing	⁷ 5.2	3.00	4.0	.38	.57	2.36	1.92	4.27	.98	.63	1.56	.82	.80	.75	

¹ Amounts are for food as purchased or brought into the kitchen from garden or farm. Amounts allow for about 5 percent of the edible food as discard due to plate waste, spoilage and the like. For general use, round the total amount of food groups for the family to the nearest tenth or quarter of a pound. In addition to groups shown, most families use some other foods: Coffee, tea, cocoa, soft drinks, punches, ades, leavening agents, and seasonings.

² Unenriched, refined bread, cereals, and flour are counted as "other foods" in the daily food guide.

³ Fluid milk and beverage made from dry or evaporated milk. Cheese and ice cream may replace some milk. Count as equivalent to a quart of fluid milk; natural or processed Cheddar-type cheese, 6 ounces; cottage cheese, 2-1/2 pounds; ice cream or ice milk, 1-1/2 quarts; unflavored yoghurt, 4 cups.

⁴ Bacon and salt pork should not exceed 1/3 pound for each 5 pounds of this group.

⁵ Weight in terms of dry beans and peas, shelled nuts, and peanut butter. Count 1 pound of canned dry beans, such as pork and beans and kidney beans, as 1/3 pound.

⁶ Cereal fortified with iron is recommended.

⁷ For pregnant and nursing teenagers, 7 quarts is recommended.

Table 2.—Food list for a month based on the thrifty food plan for an average 4-person household receiving food stamps

Foods	Amount	Foods	Amount
Milk (includes nonfat dry milk)	54 qt	Fruit, canned	5-1/2 lb
Cheese	4-3/4 lb	Fruit juice, canned	2-1/2 lb
Ice cream	6 qt	Lettuce, salad greens	4 lb
Beef	13 lb	Cabbage	2-1/2 lb
Pork	6-1/2 lb	Other fresh vegetables	7-1/2 lb
Variety meat	3-1/2 lb	Snapbeans, canned	2 lb
Poultry	7 lb	Green peas, canned	2 lb
Fish	2 lb	Other canned and frozen vegetables, vegetable soup	7 lb
Eggs	5 doz	Flour and mixes	12 lb
Dry beans	2-1/2 lb	Cornmeal	3 lb
Mature beans, canned	4 lb	Rice or pasta	6 lb
Peanut butter	2-1/2 lb	Ready-to-eat cereal, other cereal	8 lb
Carrots	3 lb	Bread	26 lb
Dark-green leafy vegetables	2 lb	Crackers	2-1/2 lb
Other dark-green and deep-yellow vegetables	1-1/2 lb	Other bakery products; soups, mainly rice or pasta	11-1/2 lb
Citrus fruit or juice	17 lb	Margarine, butter	5 lb
Tomatoes, tomato products	9 lb	Shortening, oil, or salad dressing	5 lb
Potatoes	24 lb	Sugar	8 lb
Apples	8-1/2 lb	Other sweets	5-1/2 lb
Bananas	5 lb		
Other fresh fruit	8-1/2 lb		

NOTE: Provides for the average food needs (as suggested in the thrifty food plan for men, women, and children of different ages) of 4-person households receiving food stamps, National Survey of Food Stamp and Food Distribution Program Recipients, November 1973. In addition to foods listed, most families use some other foods: coffee, tea, cocoa, soft drinks, punches, ades, leavening agents, and seasonings. Approximately 5 percent above the cost of the foods on the list is allowed for purchase of these foods when costs for the plan are estimated.

niacin, vitamin B₁₂, and ascorbic acid. However, patterns for the following categories were short in certain nutrients:

Nutrient	Sex-age category
Calcium	Teenage girls; women; men, 55 years and older
Iron	Infants; children, 1 to 2 years; teenage girls; women, 20 to 54 years
Vitamin B ₆ ¹	Teenage girls; women; men, 55 years and older
Magnesium ¹	All, 12 years and older

¹ Evaluation based on rough estimate of content of food making up food consumption patterns. Content of this nutrient in many foods in the patterns is not known.

Fat in consumption patterns of older teenage boys, of men, and of women 20 to 54 years of age provided more than 40 percent of food energy—the upper limit for fat allowed in the plans. The number of eggs in the patterns for all persons over 9 years of age exceeded the limit of four per week set for the plans.

To meet nutritional goals for the plan within cost limitations, adjustments to consumption patterns were required. These adjustments involved the use of less meat, poultry, fish, and eggs and more dry beans, dry peas, and grain products.

Nutritional Quality of the Thrifty Plan

The thrifty plan provides the allowances plus 5 to 10 percent for food energy and plus 5 percent or more for protein, calcium, iron, vitamin A value, thiamin, riboflavin, niacin, and ascorbic acid. Fat provides 30 to 39 percent of the food energy. Nutritive values for average selections of foods within food groups, as made by survey households with relatively low food costs, were assumed in evaluating the plan.

The higher iron enrichment level for bread and flour proposed by the Food and Drug Administration in 1973 was assumed in the development of the food plans. If that enrichment level is not adopted, the nutritional goal for iron will not be met by the plans for young children, teenage girls, and women of childbearing age when average selections within food groups are made. However, the goal can be met through the frequent selection of foods

providing important amounts of iron, such as lean meats, liver, heart, kidney, shellfish, dry beans, dry peas, dark-green vegetables, dried fruit, cereals with iron added, and molasses. Plans for all sex-age categories provide iron in excess of the amount specified by the Food and Nutrition Board as likely to be furnished by a balanced and varied diet—6 mg. of iron per 1,000 kcal—when current enrichment levels are assumed. Iron-fortified cereal is recommended for infants and children 1 to 2 years of age.

The vitamin B₆, vitamin B₁₂, and magnesium contents of many foods in the plan are not known. Nevertheless, a rough estimate was made of levels provided by the plan. Foods in the thrifty plan (and the three more expensive plans) furnish more than the allowances for vitamin B₁₂ but do not meet the allowances for vitamin B₆ and magnesium for several sex-age categories. Plans that meet the nutritional goals for vitamin B₆ and magnesium can be developed by using the food composition data available, but such plans contain large amounts of vegetables, fruits, and cereals—two to three times as much as consumed by some sex-age categories in 1965-66. Such distortion of food consumption patterns is not justified on this basis. Therefore, 80 percent of the allowances for vitamin B₆ and magnesium was used as the basis for goals in developing all of the USDA food plans.

Estimates were not made of levels provided by the plan of some nutrients for which there are allowances. Phosphorus levels were not calculated but are believed to be well above the allowances. The use of iodized salt is recommended as an efficient way to supplement dietary iodine. The requirement for vitamin D for normal persons can be met by exposure to sunlight. However, for infants and elderly persons whose activities limit their exposure to sunlight, the allowance should be provided in the diet by such foods as eggs, liver, butter, and milk fortified with vitamin D or by supplementation. Insufficient reliable information is available on the content in foods of the three other nutrients for which allowances are set—vitamin E, folacin, and zinc—to make reliable estimates of levels provided by the plans.

Food plans developed to meet the allowances would be expected to provide generous amounts of nutrients for most persons. The Food and Nutrition Board states that the basis for the allowances is such that “even if a person habitually consumes less than the recommended amounts of some nutrients, his diet is not necessarily inadequate for those nutrients” (4, p. 12).

Allowances are not specified for some dietary factors. An example is linoleic acid, an essential fatty acid found in large concentrations in many oils that come from plants. Notable exceptions are olive oil and coconut oil. Margarines, salad dressings, mayonnaise, and cooking oils are usually made from one or more vegetable oils. Another example is dietary fiber. Good sources of fiber include

whole-grain cereals, fruits, vegetables, and legumes, such as dried peas and beans.

Planning Meals Based on the Thrifty Plan

Meals based on the thrifty plan will not be elaborate. They rely heavily on cereal and bread, and contain less meat, poultry, and fish and less vegetables and fruit than most families customarily eat. However, food managers with interest and skill in buying and preparing food can serve varied and appetizing meals based on the plan.

The week's menus in table 3 illustrate the kinds of meals and snacks that might be served. The amounts of foods on the menus that are served to family members will differ depending on individual food needs. For example, at a meal young children may eat $\frac{1}{4}$ cup of vegetable and teenagers $\frac{1}{2}$ cup. Generally, servings of bread and cereals are generous and servings of meat, poultry, and fish are small.

The meals include a variety of foods from the basic four food groups. They can be prepared from foods typical of those used by survey households with relatively low food costs—foods that are generally available in stores across the country. The meals are not expected to suit any family entirely. The family may not care for some of the foods included or may prefer to eat more informally than the menus suggest. The meals are not expected to suit any nutritionist entirely either. The nutritionist will see immediately that some foods on the menu can be replaced with others that provide larger amounts of certain nutrients; and that some foods can be replaced with others that cost less. Such replacements, of course, can be made as desired. Nutritionists are encouraged to adapt the menus to show how foods commonly used by families they work with can be used in economical nutritious diets.

The menus in table 3 are a part of a meal plan for a month which includes menus with recipes and amounts of foods for a family of four following the thrifty food plan (3). As a part of the development of the meal plan, several four-person families receiving food stamps were asked to try it. The families purchased the food needed using their food stamps and prepared and ate the meals proposed in the plan. Home economists made daily visits to the households to record reactions of family members.

The families paid no more for the food needed than USDA's estimate for the cost of the plan for the average four-person family receiving food stamps. The meal plan was found to be generally acceptable by all families participating in the trial. Food managers could store the food needed for a week properly at home; they could prepare and serve food with the equipment and within the amount of time available. As much or more food was included in the meals than the families were accustomed to having; but as expected, the food selections and types of

meals in the plan were not always as preferred. Because of this, some family members did not use the food exactly according to the plan even though they had agreed to do so. Several changes recommended by the families were made in the proposed meal plan and in the way it was presented before the plan was released.

OTHER ECONOMICAL FOOD PLANS

The thrifty plan is only one of many nutritious combinations of food groups possible at extremely low cost. Amounts of food groups in consumption patterns could be changed in other ways to provide nutritious diets. While such combinations would deviate further than the thrifty plan from food consumption patterns, they might be acceptable to some households.

Other food plans at the same or lower cost than the thrifty plan could be developed if selections of foods within food groups are limited to only those foods which are the least expensive, rather than selections typical of those of survey households. For example, the thrifty plan contains some fluid milk, as is typical of the consumption of the survey households. Nonfat dry milk costs only about half as much as fluid milk, yet provides as much or more of most nutrients supplied by fluid milk. Therefore, a plan that assumes the use of nonfat dry milk exclusively might be developed at a cost lower than the cost of the thrifty plan. Or a plan at the same cost as the thrifty plan might be developed with only nonfat dry milk and more meat, poultry, and fish and less dry beans and grain products than the thrifty plan.

Through guidance materials and nutrition education programs, families using food stamps and other families wishing to economize on food are encouraged to use the economical foods within the food groups. However, for purposes of estimating the cost of the plan for use nationwide, selections of foods based on those made on the average by survey families with relatively low food costs are believed to be more reasonable. Such selections are used, recognizing that some families following the plan might not have either the skill or the opportunity to consistently select foods within food groups that are more economical than those made on the average by these survey households.

INFORMATION ABOUT THE FAMILY FOOD PLANS

The food plans are developed and their costs estimated by the Consumer and Food Economics Institute, Agricultural Research Service, U.S. Department of Agriculture, Hyattsville, Maryland 20782. Single copies of the following reports about the food plans are available upon request from the Institute:

Table 3.—A week's menus based on the thrifty food plan

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
B R E A K F A S T	Orange juice French toast Sirup Beverage	Orange juice Ready-to-eat cereal Doughnut Beverage	Peaches, sliced Grits Cinnamon toast Beverage	Orange juice Eggs Pan-fried potatoes Toast Beverage	Peaches, sliced Ready-to-eat cereal Toast Beverage	Apple juice Farina Toast Beverage	Apples, quartered Pancakes Sirup Beverage
L U N C H	Beef pot roast Gravy Mashed potatoes Mixed vegetables Bread Ice milk Beverage	Grilled cheese sandwiches Macaroni salad Baked apples Beverage	Frankfurters Sauerkraut Bread Oatmeal cookies Beverage	Beef macaroni soup Saltine crackers Plums Beverage	Noodle soup Peanut butter and jelly sandwiches Carrot sticks Graham crackers Beverage	Frankfurter bean soup Saltine crackers Oatmeal cookies Beverage	Cheese sandwiches Gelatin (with apple juice and celery) Meringue pie Beverage
D I N N E R	Beans in tomato sauce Macaroni salad Pear halves Corn bread Gelatin Beverage	Beef stew with vegetables Cornbread Ice milk Beverage	Beef pie with vegetables Refrigerator biscuits Lettuce wedges with dressing Peanut butter cake Beverage	Fried chicken Rice Gravy Corn Bread Peanut butter cake Beverage	Beef patties Baked potatoes Stewed tomatoes Muffins Ice milk Beverage	Cheese rarebit on toast French-fried potatoes Collards Meringue pie Beverage	Spaghetti with meat sauce Tossed salad (lettuce, carrots, dressing) Bread sticks Ice milk Beverage
S N A C K	Doughnut	Bread and jelly sandwiches	Cheese and saltine crackers	Doughnut	Peanut butter cake	Graham crackers	Ready-to-eat cereal

Note: Milk for everyone at least once daily, and for children, teenagers, and pregnant and nursing women, more often. Spreads for bread and sugar for cereal, coffee, and tea may be added if desired.

- The Thrifty Food Plan, CFE (Adm.)326, presents the thrifty plan developed in 1975 and describes its development and costing.
- The Thrifty Food Plan, Sample Meals for a Month, CFE (Adm.)327, presents a month's menus with lists of food and recipes needed to provide the meals for a family of four following the thrifty food plan.
- Cost of Food at Home Estimated for the Thrifty Food Plan is sent quarterly to persons requesting these estimates.
- USDA Family Food Plans, 1974, presents the low-cost, moderate-cost, and liberal food plans as revised in 1974

and describes the development and costing of the plans and the use of the plans and their costs in family budgeting.

- Money-Saving Meals presents 2 weeks' menus typical of those that might be served following the low-cost plan.
- Cost of Food at Home Estimated for Food Plans at Three Cost Levels, a table showing costs for the low-cost, moderate-cost, and liberal food plans, is sent quarterly to persons requesting these estimates. (Costs for the plans are published quarterly in *Family Economics Review*, a publication prepared by the Institute, and monthly in *Food and Home Notes*, a weekly release prepared by the Office of Communication of USDA).

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